Announcements

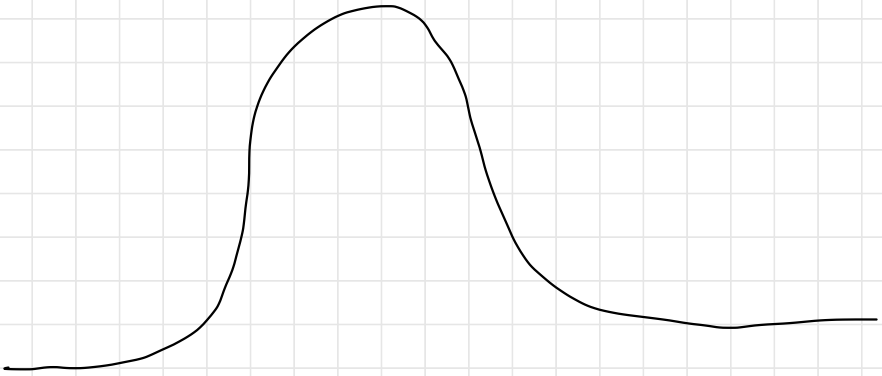
1. Wednesday Review Session. Please bring questions for me to do!

2. Github updated w/ notes

3. Format today

Normal Approximation (Central Limit Theorem)

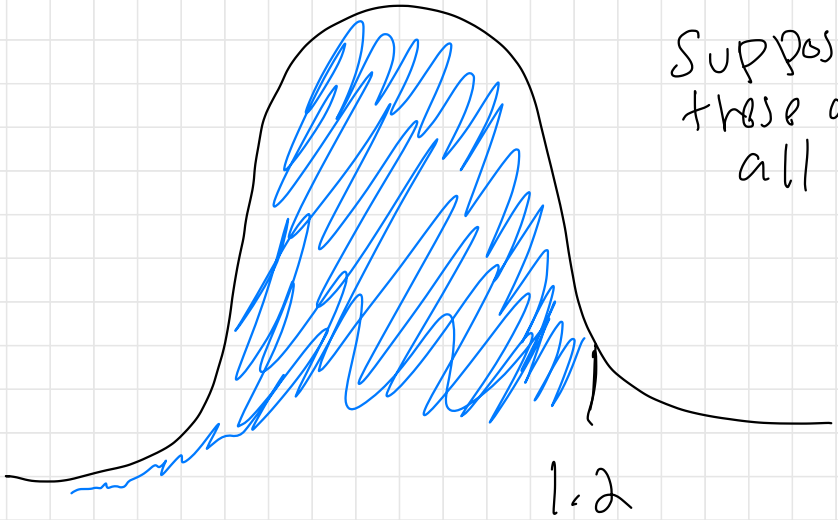
For sums of random variables they follow approximately the normal distribution.



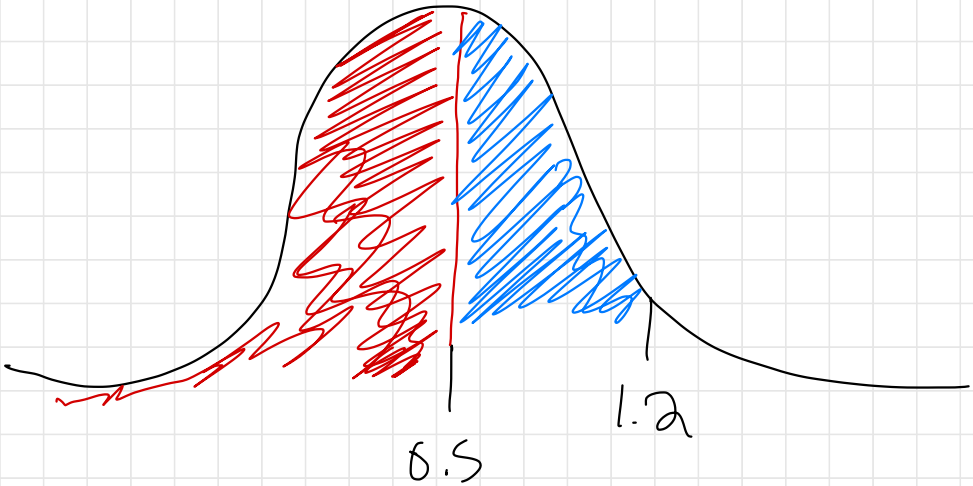
$$y = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}x^2\right)$$

Standardizing

$$SU = \frac{\text{value} - \text{avg}}{\text{sd}} = \frac{\text{value} - EV}{SE}$$



pnorm(1.2)



pnorm(1.2) = blue + red

pnorm(0.5) = red

pnorm(1.2) − pnorm(0.5) = blue

This is an approximation

(conditions to use normal approximation) (box model)

1) Valid at least 25 draws

2) $EV \pm 2SE$ is in range of possible values

Ex. 99 0 1

100

this is binomial, $p = 0.01$, $n = 100$

$$EV = 1$$

$$SE = \sqrt{n}\sqrt{p(1-p)} = 10 \cdot \sqrt{0.01 \cdot 0.99}$$

$$\approx 1$$

$$EV - 2SE < 0$$

$\Rightarrow$ Bad case for normal approximation